REMARKS

In the Office Action, claims 1-7, 9-16, 18 and 20-31 were rejected. The rejection is respectfully traversed, and claims 1-7, 9-16, 18 and 20-31 remain pending in the present application.

In the Office Action, claims 18, 20-23, 25 were rejected under 35 USC 102(b) as anticipated by the Hartog et al. reference, US Patent No.: 5,821,861. This rejection is respectfully traversed because the Hartog et al. reference fails to disclose all elements of the subject claims. Accordingly, the rejection under 35 USC 102(b) should be withdrawn.

The Hartog et al. reference discloses a system for monitoring shell temperatures in a reactor. The system comprises a bundle of optical fibers 20 that are located in a tubular metal sheath 24 positioned on the outside of a shell 16. The optical fibers 20 are connected to processing equipment 28 by a fiber optic field junction box 22. (See column 2, lines and 46-52). However, the processing equipment 28 is described as a control system for the optical fibers. For example, the processing means 28 comprises a laser source (See column 3, lines 1-3) used in providing the spatial resolution of the system and is described as a "reflectometry processing means 28" (See column 5, lines 23-25). Accordingly, the Hartog et al. reference provides no description or teaching related to an optical fiber distributed temperature system that monitors temperature in a body in combination with a control unit that automatically controls parameters in the body depending on the temperature profile.

On page 12 of the Office Action, a statement is made that "the Examiner's position that turning on cooling air when the wall (body) is hot in order to limit its temperature (change parameter) which is inherently done automatically, satisfies the Applicant's claimed invention." However, Applicant respectfully responds that this statement is not an accurate characterization of the Hartog et al. reference which does not appear to use any type of automatic control based on temperature profile. The "cooling air" is part of a recalibration system that can be used when an operator wishes to re-map the fiber loop system.

The "cooling air" is provided through air nozzles designed to cause localized cooling, but this localized cooling is provided when necessary to "re-map" the system after there has been a change in configuration of the fiber loop. An air line 30 is installed alongside the reactor vessel and has small holes 34 drilled along its entire length to form a series of nozzles. Compressed air is flowed through the air line 30 and exits through the holes 34 in small jets of air which impinge on the shell to cause localized cooling of a band-shaped region of the shell. The cooled areas that cross the fiber-containing sheath 24 show up in a temperature trace produced by the temperature monitoring system 28. (See column 3, lines 32-50).

Accordingly, the Hartog et al. fails to disclose elements of the subject claims and therefore the reference is not an anticipatory reference. By way of example, the Hartog et al. reference fails to disclose or suggest monitoring temperature in a body by use of a "distributed temperature system including an optical fiber that is located within the conduit" combined with "automatically controlling parameters in the body depending on the temperature profile obtained by the distributed temperature system" as recited in independent claim 18. Accordingly, the rejection under 35 USC 102(b) should be withdrawn.

Claims 20-23 and 25 ultimately depend from independent claim 18 discussed above and recite additional unique elements. Accordingly, the rejection under 35 USC 102(b) also should be withdrawn with respect to these dependent claims.

Claims 1-3, 5-7 and 10 were rejected under 35 USC 103(a) as unpatentable over the Hartog et al. reference in view of the DeBruin reference, US Publication No.: 2008/0312406. This rejection is respectfully traversed.

In the Office Action, the Hartog et al. reference is characterized as disclosing that "processor 28 obtains temperature distributed data from the sensor, monitors it (body parameters) and makes/ performing a process (automatic) control by controlling heating element (controlling temperature within an acceptable range)." (See Office Action, page 3). However, Applicant disagrees with this characterization and respectfully submits the Hartog et al. reference fails to

make such disclosure. As discussed above, the processor 28 of the Hartog et al. reference is described as processing equipment for use with optical fibers 20. The processing means 28 comprises a laser source (see column 3, lines 1-3) that is used in providing the spatial resolution of the system and is described as a reflectometry processing means 28. (See column 5, lines 23-25). As mentioned previously, the Hartog et al. reference provides no description or teaching related to a distributed temperature system that monitors temperature in a body in combination with a control unit that automatically controls parameters in the body depending on the temperature profile. Accordingly, the Hartog et al. does not provide the teachings for which it is cited in the rejection of claims 1-3, 5-7, 10, and the rejection under 35 USC 103(a) should be withdrawn.

Additionally, on page 3 of the Office Action a further statement is made that the Debruin reference "states that some reactors, especially ester exchange reactors have such internals as weirs, trays, downcomers, and also need temperature control, and thus knowledge of temperature inside reactor." However, no specific reference citations were provided and Applicant was unable to find these teachings in the Debruin reference. The Debruin reference teaches employment of at least one weir along the interior surface of an esterification pipe reactor. (See page 26, paragraph 0374, and Figure 4). Additionally, the Debruin reference describes the use of a weir or weirs to control liquid levels in each pipe level of a reactor. (See page 28, paragraphs 0402-0406, and Figure 9). However, Applicant respectfully submits the reference does not disclose other elements for which it is relied on to support the present rejection under 35 USC 103(a). Accordingly, no prima facie case of obviousness can be established and the rejection of claims 1-3, 5-7, 10 should be withdrawn.

By way of specific examples, the combination of references fails to disclose, teach or suggest a distributed temperature system "comprising an optical fiber positioned in the conduit" combined with a control unit that "automatically controls parameters in the body depending on the temperature profile to ensure that the process is within an acceptable range" as recited in independent claim 1. The references further fail to disclose, teach or suggest "a tray, an outlet weir, and a downcomer positioned within the body" combined with the conduit and the optical fiber providing a temperature profile of temperatures in at least a portion of the body "containing

the tray, the outlet weir and the downcomer" as also recited in independent claim 1. Accordingly, no prima facie case of obviousness has been established and the rejection under 35 USC 103(a) should be withdrawn with respect to independent claim 1 and its dependent claims 2-3, 5-7 and 10.

Claims 24, 26-31 were rejected under 35 USC 103(a) as unpatentable over the Hartog et al. reference in view of the Anderson et al. reference, US Patent No.: 4,703,174, and the Mercer reference, US Patent No.: 2,499,105. This rejection is respectfully traversed. Claims 24, 26-31 ultimately depend from independent claim 18 and recite additional elements. As discussed above with respect to independent claim 18, the Hartog et al. reference fails to disclose or suggest elements of the independent claim or its dependent claims. The Anderson et al. and Mercer references provide no additional disclosure that would obviate the deficiencies of the Hartog et al. reference. Accordingly, the rejection under 35 USC 103(a) should be withdrawn.

Additionally, the Anderson et al. reference is relied on for the proposition that: "a fiber optic sensor for sensing pressure and temperature could be used along with a distillation vessel." (See Office Action, page 4). However, the Anderson et al. reference instead teaches a temperature sensor 100 having a housing 102, a carrier 104, and temperature sensitive members 106. Each temperature sensitive member 106 comprises a pair of bimetallic strips that react to changes in temperature. (See column 7, lines 29-61). An optical fiber 16 is used as a communication line for carrying a light signal. When exposed to heat, the bimetallic strips bow and cause carrier 104 to move away from optical fiber 16. As a result less light is reflected back into the optical fiber from a reflective surface 112. (See column 8, lines 3-16).

Accordingly, the Anderson et al. reference fails to teach the fiber optic sensor and distillation vessel for which it is cited. In fact, the Anderson et al. reference teaches away from this approach by utilizing a conventional bimetallic sensor to detect temperature changes. Without the teachings of the present application, one of ordinary skill in the art would be led away from the approach taught and claimed in the presently pending application in which a distributed temperature sensor is formed with an optical fiber. Consequently, the cited references fail to disclose, teach or suggest the elements of the subject claims and no prima facie

case of obviousness can be established. The rejection under 35 USC 103(a) should be withdrawn.

Claims 9, 12-15 were rejected under 35 USC 103(a) as unpatentable over the Hartog et al. reference and the Debruin reference and further in view of the Anderson et al. reference and the Mercer reference. This rejection is respectfully traversed. Claims 9, 12-15 ultimately depend from independent claim 1 and recite additional elements. As discussed above with respect to independent claim 1, the Hartog et al. reference and the Debruin reference fail to disclose or suggest elements of the independent claim or its dependent claims. The Anderson et al. and Mercer references provide no additional disclosure that would obviate the deficiencies of the Hartog et al. reference and the Debruin reference. As described previously, the Anderson reference also fails to provide the teachings for which it is cited in the Office Action. Accordingly, the rejection under 35 USC 103(a) should be withdrawn.

Claims 24, 26-31 were rejected under 35 USC 103(a) as unpatentable over the Hartog et al. reference in view of the Chuang et al. reference, US Patent No.: 7,211,702, and the Camson reference. This rejection is respectfully traversed. Claims 24, 26-31 ultimately depend from independent claim 18 and recite additional elements. As discussed above with respect to independent claim 18, the Hartog et al. reference fails to disclose or suggest elements of the independent claim 18 or its dependent claims. The Chuang et al. reference provides no additional disclosure that would obviate the deficiencies of the Hartog et al. reference. Furthermore, Applicant did not find a patent number or other reference number associated with the cited Camson reference. (In a subsequent rejection, a Gamson reference is cited with a corresponding US patent number 3,440,865, but the Gamson reference also would fail to obviate the deficiencies of disclosure found in the other cited references.) Accordingly, the rejection should be withdrawn.

The Chuang et al. reference describes a catalytic distillation column 12 having a body 22 and an interior cavity 30. (See column 7, lines 38-40). The Chuang et al. invention is designed to provide a process by which, in part, an olefin is hydrated to produce a corresponding alcohol under mild conditions. In another aspect of the invention, a process is provided to remove water

from an azeotropic mixture of an alcohol and water to allow recovery of the corresponding substantially anhydrous alcohol under mild conditions. (See column 3, lines 41-59). However, the Chuang et al. reference does not appear to describe control over temperature and pressure of a vessel by valves and automatic controllers to keep process parameters within an acceptable range, as stated in the Office Action. (See Office Action, page 6). Accordingly, the disclosure of the cited references is not sufficient to support a prima facie case of obviousness under 35 USC 103(a), and the rejection should be removed.

Claims 11-16 were rejected under 35 USC 103(a) as unpatentable over the Hartog et al. reference and the Debruin reference and further in view of the Chuang et al. reference and the Camson reference. This rejection is respectfully traversed. Claims 11-16 ultimately depend from independent claim 1 and recite additional elements. As discussed above with respect to independent claim 1, the Hartog et al. reference and the Debruin reference fail to disclose or suggest elements of the independent claim 1 or its dependent claims. The Chuang et al. reference provides no additional disclosure that would obviate the deficiencies of the Hartog et al. reference and the Debruin reference. Furthermore, Applicant did not find a patent number or other reference number associated with the cited Camson reference. (In a subsequent rejection, a Gamson reference is cited with a corresponding US patent number 3,440,865, but the Gamson reference also would fail to obviate the deficiencies of disclosure found in the other cited references.) Accordingly, the rejection should be withdrawn.

Claims 24, 26-31 were rejected under 35 USC 103(a) as unpatentable over the Hartog et al. reference in view of the Anderson et al. reference and the Gamson reference, US Patent No.: 3,440,865. This rejection is respectfully traversed. Claims 24, 26-31 ultimately depend from independent claim 18 and recite additional elements. As discussed above with respect to independent claim 18, the Hartog et al. reference fails to disclose or suggest elements of the independent claims or their dependent claims. The Anderson et al. and Gamson references provide no additional disclosure that would obviate the deficiencies of the Hartog et al. reference. Accordingly, the rejection should be withdrawn.

Furthermore, the Anderson et al. reference is again relied on for the proposition that "a fiber optic sensor for sensing pressure and temperature could be used along with a distillation vessel." (See Office Action, page 9). As described above, the Anderson et al. reference instead teaches a temperature sensor 100 having a housing 102, a carrier 104, and temperature sensitive members 106. Each temperature sensitive member 106 comprises a pair of bimetallic strips that react to changes in temperature. (See column 7, lines 29-61). An optical fiber 16 is used as a communication line for carrying a light signal. When exposed to heat, the bimetallic strips bow and cause carrier 104 to move away from optical fiber 16. As a result less light is reflected back into the optical fiber from a reflective surface 112. (See column 8, lines 3-16).

The Anderson et al. reference again fails to teach the fiber optic sensor and distillation vessel for which it is cited and teaches away from this approach by utilizing a conventional bimetallic sensor to detect temperature changes. Consequently, the cited references fail to disclose, teach or suggest elements of the subject claims and no prima facie case of obviousness can be established. Accordingly, the rejection under 35 USC 103(a) should be withdrawn.

Claims 9, 12-15 were rejected under 35 USC 103(a) as unpatentable over the Hartog et al. reference and the Debruin reference and further in view of the Anderson et al. reference and the Gamson reference. This rejection is respectfully traversed. Claims 9, 12-15 ultimately depend from independent claim 1 and recite additional elements. As discussed above with respect to independent claim 1, the Hartog et al. and Debruin references fail to disclose or suggest elements of independent claim 1 or its dependent claims. The Anderson et al. and Gamson references provide no additional disclosure that would obviate the deficiencies of the Hartog et al. reference and the Debruin reference. Furthermore, Applicant respectfully submits the Anderson et al. reference does not disclose the elements for which it is relied on to support the rejection, as discussed above. Accordingly, the rejection under 35 USC 103(a) should be withdrawn.

It should be further noted that the Office Action does not specifically reject claim 4. Accordingly, Applicant respectfully requests an indication of the allowability of claim 4 or a specific rejection of claim 4 in a subsequent Office Action.

In view of the foregoing remarks, all pending claims are believed to be in condition for allowance. However, if the Examiner believes certain amendments are necessary to clarify the present claims or if the Examiner wishes to resolve other issues by way of a telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

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